

REMARKS / ARGUMENTS:

Claims 1 – 102, 105, 107, 111, 113 – 116, 118 - 133, 149, 151 and 152 have been cancelled without prejudice to the patentability of the subject matter described therein and may be reasserted in this or another patent application.

Claims 103, 117, 134, 135, 144 – 148, 150, 153 and 154 have been amended.

Claims 103 and 146 have been amended by describing the agronomic plant as a legume, support for which is found in the specification at least at page 14, line 3. Claim 103 is further amended by narrowing the description of the aromatic ring to benzene, thiophene, furan, and benzothiophene. Claims 103 and 146 have also been amended by narrowing the description of Z₁ and Z₂ to carbon and by narrowing the description of Q to carbon or silicon.

Claims 134, 135, 144, 145 – 148 and 150 have been amended by narrowing the description of Q to C or Si.

Claim 117 has been amended to correct dependency.

Claims 153 and 154 have been amended to limit the plants to legumes and to make the language correspond with the language of claim 103, from which each depends.

Claims 103, 104, 106, 108 - 110, 112, 117, 134 – 148, 150 and 153 - 158 are pending in the case.

No new matter has been added.

General remarks regarding the prosecution of the application:

It is noted that this application has been transferred to its third examiner and that the Action dated November 15, 2006, is the second withdrawal of an indication of an allowance of claims if rewritten to include limitations of claims from which the claims depend after Applicant's good faith effort to put such claims in condition for allowance. With respect, the undersigned believes that this degree of discontinuity in the prosecution of the application has resulted in extending the time of prosecution and in escalating the costs of prosecution for the Applicant. In the present Response, the Applicant has attempted to respond to each and every issue that was raised in the

Action dated November 15, 2006, and believes that the claims are now in condition for allowance, which action is respectfully requested.

The decision of the Examiner to examine the claims to their full extent is noted with appreciation.

Withdrawal of allowability of claims 106, 112, 116 and 122 if rewritten in independent form including all of the limitations of the base claim and all intervening claims..

The decision of the Office to withdraw the indication of allowability of claims 106, 112, 116 and 122 if rewritten to include the limitations of the base claim and all intervening claims is noted. The Applicant respectfully disagrees with the reasons put forward for this decision and reserves the right to traverse and/or to petition for the reversal of this action.

The Applicant notes with appreciation the Office's recognition on page 5 of the Action of the non-obviousness of the claims over Phillion *et al.* in view of Theodoris *et al.* and Branley *et al.*

Rejection of claims 103 – 104, 106, 108 – 110, 112 – 114, 116 – 118, 120, 122 and 134 - 158 under 35 USC §112, first paragraph, as lacking enablement for the full scope of the claims.

It is respectfully requested that the rejection of claims 103 – 104, 106, 108 – 110, 112 – 114, 116 – 118, 120, 122 and 134 - 158 under 35 USC §112, first paragraph, as lacking enablement for the full scope of the claims be reconsidered for the reasons discussed below and be withdrawn.

The Applicant respectfully traverses the present rejection of claims on the ground of lack of enablement, and maintains that the specification fully enables all claims as originally filed, as well as the claims asserted in the Response dated May 7, 2006, and the present claims as shown above. The Applicant reasserts its arguments presented earlier that the Office has failed to establish a valid *prima facie* case of non-enablement under 35 USC §112, first paragraph, because it has not set forth a reasonable explanation as to why the scope of protection provided by the claim is not adequately enabled by the description of the invention provided in the specification. Alternatively,

the Applicant maintains that if the Office has, in fact, established a *prima facie* case for lack of enablement, the Applicant has successfully rebutted such a case through its claim amendments and arguments discussed herein. Solely in order to facilitate the prosecution of the present application and without admitting that its original claims are invalid for any reason, the Applicant has amended the claims to obviate the present ground of rejection.

In particular, claim 1 has been amended to narrow the description of the fungicide to one having an aromatic ring selected only from benzene, thiophene, furan and benzothiophene, rather than from nine alternatives. Furthermore, the ring structure is limited to a carbon ring and cannot be a heterocyclic ring, as previously was possible. Also, the element "Q", has been narrowed to only carbon and silicon, from the four possibilities formerly described.

Silthiofam is a characteristic representative of the general structure now provided for the fungicide and one of ordinary skill would reasonably expect that fungicidal compounds having the general structure now shown would have the same or very similar activity as silthiofam.

In addition, the agronomic plant has now been narrowed to a legume. It is maintained that legumes share significant commonality of biological pathways and also share significant commonality of fungal pests. Accordingly, it is maintained that one of ordinary skill would reasonably expect that any legume would have the same or very similar reaction to the application of the fungicide of the present claims as soybean. The scope of all dependent claims has been amended correspondingly.

The Office has argued that the claims are rejected as "lacking enablement for the full scope of the claims", and that the "specification fails to provide information that would allow the skilled artisan to fully practice the instant invention without **undue experimentation**." The Office's argument to support this position includes a discussion of factors cited in *In re Wands*.

As to the factors cited in *Wands* as determining whether a disclosure would require undue experimentation, the Applicant maintains that the consideration of these factors in view of the present claims clearly establish that the present specification does not require undue experimentation for the following reasons.

The nature of the invention:

The Office characterized the invention as pertaining to a method of increasing the vigor and/or the yield of any agronomic plant that has had a transgenic event to confer resistance to any herbicide, by providing to the plant or its propagation material the herbicide along with any of the numerous and diverse fungicide compounds as recited in the claim that also have the functional limitation of not be active against the pathogens of that particular plant.

The claims as amended now describe a method of increasing the vigor and/or the yield of a legume that has a transgenic event conferring resistance to a herbicide by treating the plant or its propagation material with the herbicide along with a fungicide having a particular chemical structure that has no activity against a fungal pathogen of that particular plant.

The state of the prior art:

The Office correctly characterizes the state of the art regarding the action of fungicides to control fungal pathogens of plants as being well developed. Also correct is the Office's characterization of the art regarding the action of fungicides for enhancing plant growth in plants that are not afflicted by the fungi that the fungicides are known to control as being not well developed. However, as discussed below in more detail, experimentation to fully enable the present invention, if any, requires only methods and techniques that, like those in *Wands*, are well known in the art and does not require undue experimentation.

The relative skill of those in the art:

Although not addressed by the Office, the Applicant maintains that the relative skill of a practitioner in the art of plant and seed treatment is very high. The reason for this is that numerous universities, government organizations, private institutions, and industrial companies train and employ technicians and scientists having basic and advanced degrees in this area of technology. Research and development efforts are important at several international firms and institutions. And the volume and availability of high quality technical publication in the field is very high.

The predictability of the art and the breadth of the claims:

The Office has stated, without support, that the herbicidal/fungicidal art is unpredictable. Furthermore, the Office argued that the claim language requiring that the fungicide has no significant activity against fungal plant pathogens for the treated plant is functional language. The Office has argued that functional language alone at the point of novelty "is admonished", and that "[A] written description of an invention involving a chemical genus, like a description of a chemical species, required a precise definition, such as by structure, formula, [or] chemical name, of the claimed subject matter sufficient to distinguish it from other materials."

With respect, the present claims do exactly that, and in addition, require that the fungicide, which is precisely described in terms of its chemical structure, fulfill the functional requirements stated in the claim. Accordingly, it is maintained that the combination of the structural and the functional elements of the claim greatly improve the predictability of the claimed invention and fully enable a skilled practitioner to carry out any and all methods or tests that may be required to practice the invention.

The amount of direction or guidance presented and the presence or absence of working examples:

The Office has argued that the specification does not provide adequate guidance as to how one of ordinary skill in the art can reasonably select plant/fungicide combinations where the plant has pathogens that cannot be treated by the fungicide without undue experimentation, and instead merely lists a number of different crops and numerous and diverse different fungicides that could be tried.

The present claims require the treatment of a plant or its propagation material with a fungicide having a particular chemical structure wherein the fungicide has no significant activity against fungal plant pathogens for such agronomic plant, wherein the plant or its propagation material possesses a transgenic event providing the plant with resistance to a herbicide and the treatment comprises foliar application of said herbicide.

Every element of the present claims is fully supported in the specification. In particular, the invention is described in general at paragraphs 0013 – 0064 and 0074 - 0082 of the specification (with reference to its publication as US 2003/0114308 A1), plants on which the invention is useful are described in the specification at paragraphs

0083 and 0086 – 0087, plants having transgenic events conveying herbicide resistance are described at paragraphs 0087 – 89, herbicides are described in paragraphs 0361 – 0363, fungicides that are useful in the invention are described in detail in paragraphs 0092 – 0353, methods for the treatment are discussed in paragraphs 0354 – 0360 and 0364 – 0386. Examples are provided for treating seeds with and without an inoculant (Example 1), and showing the effect on yield and vigor of soybeans treated with silthiopham (Examples 2 and 3), and showing the activity of silthiopham on *G. graminis* and several fungal pathogens of soybeans. Example 5 illustrates a method for testing the effect on soybean yield and vigor of seed treatment with silthiopham with and without an inoculant. The results of such a protocol are shown in the Declaration of Mr. Sanders, which is attached hereto.

As the Applicant has pointed out previously, and the Office has not rebutted, the identify of fungal pathogens for a given plant are well known. Accordingly, given a plant (a legume in the present claims), one of ordinary skill in the art can easily find in the literature the identity of its fungal pathogens. Thus far, no testing at all is required. Next, the skilled practitioner has only to find in the literature whether a fungicide having the chemical structure disclosed by the present claims has activity against any of the fungal pathogens that were previously identified. This step likewise requires no testing, but simply requires access to the pertinent literature in the field. If the chosen fungicide has no significant activity against any of the fungal pathogens identified for the legume, then it meets the requirements of the claims. Should new fungicides be discovered that meet the structural requirements of the claims, whether or not the fungicide has activity against a fungal plant pathogen is a standard test that is carried out regularly by practitioners skilled in the art of plant protection with fungicides.

The Office next argues that the working examples "show improved results only for those seeds treated with both the inoculant and the silthiopham, with the seeds that have been treated only with silthiopham faring more poorly."

Enclosed with this paper and made a part of this response is the Declaration of Ernest F. Sanders Under 37 C.F.R. §1.132 that was prepared for and filed in the European Patent Office in support of Application No. 01 988 407.1, which is a

counterpart of the present application. In this Declaration, Mr. Sanders shows data and gives his opinion that

"evidence shows that seeds treated with silthiofam demonstrate a higher yield than seeds not treated with silthiofam whether or not the treated seeds are also treated with an inoculant."

Accordingly, it is maintained that the data shown in this Declaration fully supports the present claims for improvement where silthiofam and an inoculant are both used, and also where silthiofam alone is used.

The Office argues that "the evidence in the examples is not commensurate in **scope** with the claimed invention and does not demonstrate criticality of the types of transgenic plants, fungicides and/or herbicides in the claimed method." With respect, the Office has pointed to no statutory support for the requirement that the examples show the criticality of the claim elements, and the Applicant knows of none. Although demonstration of criticality might be necessary to overcome a rejection under 35 USC §103(a), it is irrelevant with respect to enablement under 35 USC §112, first paragraph. As in *Wands*, the present disclosure provides considerable direction and guidance on how to practice the claimed invention and presents working examples. Also as in *Wands*, there was a high level of skill in the art at the time when the application was filed, and all of the methods needed to practice the invention were well known.

Finally, the Office maintains that "those unknown or future known tumors must require additional or future research to discover and diagnose. Therefor, the skilled artisan has to exercise **undue experimentation** to practice the instant invention."

With respect, the Applicant does not understand this statement, in particular because the present application has nothing at all to do with tumors, or their discovery or diagnosis. It is respectfully requested, therefore, that the Office explain the pertinence and meaning of the statement.

The quantity of experimentation necessary:

The Office has argued that "[in] order to successfully carry out the invention, a person of ordinary skill in the art would need to first select a transgenic plant/herbicide combination from among the numerous and diverse plants and herbicides that encompassed by the claims. Although the present claims have been narrowed to

leguminous plants having transgenic herbicide resistance, the practice of even the original scope of this step would require no testing whatsoever. Plants and herbicides and herbicide resistant transgenic plants are well known and are discussed in detail in the specification.

After making this selection, the Office argues, the person would need to test the transgenic plant to determine what fungal pathogens it is host to and/or affected by, which could involve exhaustive testing for the many different types of fungal pathogens, known and unknown, that are capable of infecting various plants. As the Applicant has discussed above, the skilled practitioner would only have had to refer to the pertinent literature to learn the identity of fungal pathogens for a particular plant and, as the Office has recognized, the state of the art regarding the action of fungicides to control fungal pathogens of plants is well developed. It is settled law that a patent need not disclose what is well known in the art. *In re Wands*, at 1402.

The Office continues with the argument that "[a]fter determining the pathogens that afflict the particular plant, one of ordinary skill would need to determine which of the numerous and diverse fungicides encompassed by the claim do not have activity against the fungal plant pathogens, which would similarly involving [sic] even more testing and assays against each of the pathogens that have been found to afflict the selected transgenic plant." The Applicant maintains that the literature at the time of the invention teaches fungal pathogens against which a particular fungicide having the claimed general chemical structure have activity. Any testing that might be necessary at this stage would require only rudimentary methods that were well known to all skilled practitioners. Moreover, because of the limited scope of the plant and the fungicide, such testing, if any, would itself be limited in scope.

Finally, the Office argues, "[o]nce a suitable fungicide has been identified, the fungicide would need to be tested for growth enhancement by treating the plant with various selected parameters, including a selected dosing rate, a desired inoculum, etc, and observing the plant growth." The Office continues to describe alternative exhaustive testing procedures and concludes that "[s]uch lengthy and arduous testing is deemed to require unnecessary and undue experimentation on the part of one of ordinary skill in the art." The Applicant respectfully agrees with this statement, but

maintains that although the extensive testing procedures the Office has described may be useful to find and optimize each and every embodiment of the claimed invention, such testing is not required to meet the enablement requirement of 35 USC §112, first paragraph.

Accordingly, it is maintained that each of the present claims is fully supported and enabled in the specification in a manner that meets the requirements of 35 USC §112, first paragraph, and it is respectfully requested that the present rejection be reconsidered and withdrawn.

Rejection of claims 103 – 104, 106, 109, 110, 112 – 114, 116, 118 and 134 – 158 under 35 USC §103(a) over article by Roy *et al.*, in view of either U.S. Patent No. 5,486,621 to Phillion *et al.*, or U.S. Patent No. 5,994,270 to Phillion *et al.*, and further in view of U.S. Patent No. 5,914,451 to Martinell *et al.*, and U.S. Patent No. 6,277,847 to Theodoridis *et al.*

It is respectfully requested that the rejection of claims 103 – 104, 106, 109, 110, 112 – 114, 116, 118 and 134 – 158 under 35 USC §103(a) over article by Roy *et al.*, in view of either U.S. Patent No. 5,486,621 to Phillion *et al.*, or U.S. Patent No. 5,994,270 to Phillion *et al.*, and further in view of U.S. Patent No. 5,914,451 to Martinell *et al.*, and U.S. Patent No. 6,277,847 to Theodoridis *et al.*, be reconsidered for the reasons discussed below and be withdrawn.

The Office has argued that the rejected claims are obvious over the article by Roy *et al.* in view of the secondary references noted above. The Office states that "Roy *et al.* teaches that infection of soybean with *G. graminis* may be at least partially responsible for the heightened occurrence of take-all disease in subsequently planted wheat or cereal crops", and that "Roy teaches that the *G. graminis* fungus infecting the soybean can be transmitted to subsequently planted wheat". Further, the Office argues, the Phillion *et al.* patents teach fungicides for the control of take-all disease in plants, which fungicides include some of the same fungicides described in the present claims.

The Office concludes that one of ordinary skill would have found it obvious to treat the soybean plants of Roy *et al.* with the fungicides of Phillion *et al.*, because Roy teaches that the *G. graminis* fungus infecting the soybean can be transmitted to subsequently planted wheat, which causes devastating take-all disease in the wheat, and the Phillion references teach fungicides that are effective against *G. graminis*. Thus, one of ordinary skill in the art would have found it obvious to treat the soybeans with the fungicides that are effective against *G. graminis*, with the expectation of reducing the threat of the *G. graminis* to subsequently planted wheat or other cereal crops.

With respect, this tortured reasoning falls far short of establishing a *prima facie* case of obviousness under 35 USC §103(a) for at least the following reasons.

As a first matter, Roy *et al.* do not teach that the *G. graminis* fungus infecting the soybean can be transmitted to subsequently planted wheat, even stating "we have not isolated the lobed hyphopodial strain of *G. graminis* [the strain they isolated from soybeans] from field-grown wheat" (See page 825, second column, second paragraph). Moreover, Roy *et al.* conclude (p.825, end of second column): "Our study indicates there is reason to suspect that the inoculum of *G. graminis* [to infect wheat planted following legumes] may increase through its survival on soybean tissues." (underline added) Thus, the actual teachings of Roy *et al.* fall short of teaching that infection of soybean with *G. graminis* may be at least partially responsible for the heightened occurrence of take-all disease in subsequently planted wheat or cereal crops, as argued by the Office. Accordingly, the article by Roy *et al.* fails to provide the teaching that is required to support the reasoning of the Office. Furthermore, even the Office's own characterization that the Roy *et al.* article "may be at least partially" provide the required teaching, itself falls short of the requirement for obviousness set by 35 USC §103(a), namely that the actions suggested by the prior art must cause the skilled practitioner to have a reasonable expectation of success. A disclosure that describes its teachings in terms of "reason to suspect" and "may increase", and which is characterized by the Office as "may be at least partially", cannot be argued to teach a critical feature necessary to establish obviousness.

The Phillion *et al.* references indeed disclose fungicides with activity against take-all disease. However, the conclusion that it would have been obvious to treat soybeans that might be infected with *G. graminis*, which has no effect on soybeans, with fungicides having activity against *G. graminis*, with the expectation that such treatment might reduce the threat of *G. graminis* to wheat or cereal crops that might be subsequently be planted, is simply unreasonable. In other words, applying an expensive fungicide to a crop that does not need it in the hope of reducing infection of a crop that might subsequently be planted is not only not obvious, it would be considered to be an enormous waste. The skilled practitioner would simply apply the fungicide to the wheat when and if it were planted.

Neither U.S. Patent No. 5,914,451 to Martinell *et al.*, nor U.S. Patent No. 6,277,847 to Theodoridis *et al.* add the missing motivation to treat soybeans with the claimed fungicide.

Accordingly, it is maintained that the Office has failed to make a *prima facie* case of obviousness under 35 USC §103(a) and the withdrawal of the present ground of rejection is respectfully requested.

Comment at page 17, 18 regarding obviousness of properties of known compounds:

In the paragraph at the bottom of page 18, continuing to page 19, the Office argues that (regarding the recitation that the "fungicide has no significant activity against fungal plant pathogens for such agronomic plant") as the prior art renders obvious the use of the fungicide as claimed, the property of such a claimed fungicide will also be rendered obvious, since the properties, namely the activity against plant pathogens, are inseparable from the composition. The burden is shifted to the Applicant to show that the prior art product does not possess or render obvious the same properties as that recited in the claim.

The claimed method is to increase the yield or vigor of a legume by treating the plant or its propagation material with a fungicide having a certain chemical structure that has no effect against the fungal pathogens of the plant. As shown above, this method is novel and non-obvious over the prior art. Because the method is non-obvious, the property of the fungicide to increase the yield and vigor of a legume is not rendered

obvious. Accordingly, it is requested that the Office reconsider and withdraw this argument.

On page 19 of the Action, the Office applies the above reasoning to claim 114. As claim 114 has been canceled, it is maintained that such ground of rejection is moot.

On pages 19 – 22 of the Action, the Office applies the cited references to certain of the dependent claims. However, as has been shown above, because the combination of references cannot anticipate or make obvious the claims from which these claims depend, this combination cannot anticipate or make obvious any dependent claim.

Rejection of claims 108, 117, 120 and 122 as obvious under 35 USC §103(a) over article by Roy *et al.*, in view of either U.S. Patent No. 5,486,621 to Phillion *et al.*, or U.S. Patent No. 5,994,270 to Phillion *et al.*, and further in view of U.S. Patent No. 5,914,451 to Martinell *et al.*, and U.S. Patent No. 6,277,847 to Theodoridis *et al.*, and further in view of U.S. Patent No. 4,136,486 to Franklin, Jr. *et al.*

It is respectfully requested that the rejection of claims 108, 117, 120 and 122 as obvious under 35 USC §103(a) over article by Roy *et al.*, in view of either U.S. Patent No. 5,486,621 to Phillion *et al.*, or U.S. Patent No. 5,994,270 to Phillion *et al.*, and further in view of U.S. Patent No. 5,914,451 to Martinell *et al.*, and U.S. Patent No. 6,277,847 to Theodoridis *et al.*, and further in view of U.S. Patent No. 4,136,486 to Franklin, Jr. *et al.*, be reconsidered for the reasons discussed below and be withdrawn.

Claims 120 and 122 have been cancelled without prejudice and the Applicant hereby reserves the right to reassert the subject matter of either or both of these claims in this or another patent application.

Claims 108 and 117 depend ultimately from claim 103 and add the description that the seed is treated with an inoculant. The Office has argued that Franklin Jr. *et al.* teach the use of an inoculant and that it would have been obvious to use the inoculants in the methods of Roy *et al.*, the Phillion *et al.* references, Martinell *et al.* and Theodoridis *et al.*, with the expectation of achieving improved growth in soybean plants.

As the Applicant has pointed out above, the combination of Roy *et al.*, the Phillion *et al.* references, Martinell *et al.* and Theodoridis *et al.*, fails to provide a

motivation or suggestion to increase the vigor and/or the yield of a leguminous plant by treating the plant or its propagation material with a fungicide of a specific composition which has no significant activity against fungal plant pathogens for the plant, wherein the plant or its propagation material possesses a transgenic event providing the plant with resistance to a herbicide and the treatment comprises foliar application of said herbicide, as required in the present claims. The Franklin Jr. *et al.* reference fails to add this required teaching.

Accordingly, it is respectfully requested that the present ground of rejection be reconsidered and be withdrawn.

Rejection of claims 103, 104, 106, 108 – 110, 112 – 114, 116 – 118, 120, 122 and 134 – 158 under nonstatutory obviousness-type double patenting over claims 111 – 113, 115 – 117 and 122 – 125 of copending Application No. 11/138,965 as published in U.S. Patent Application Publication No. 2005/0233905.

Reconsideration of the provisional double patenting rejection (nonstatutory) of claims 103, 104, 106, 108 – 110, 112 – 114, 116 – 118, 120, 122 and 134 – 158, in view of claims 111 – 113, 115 – 117 and 122 – 125 of copending Application No. 11/138,965, as published in U.S. Patent Application Publication No. 2005/0233905, is respectfully requested.

In response to the present rejection, Applicants respectfully call the Office's attention to MPEP §804, I., B., which states:

The "provisional" double patenting rejection should continue to be made by the examiner in each application as long as there are conflicting claims in more than one application **unless** that "provisional" double patent rejection is the **only** rejection remaining in at least one of the applications.

If a "provisional" nonstatutory obviousness-type double patenting (ODP) rejection is the **only** rejection remaining in the earlier filed of the two pending applications, while the later-filed application is rejectable on other grounds, **the examiner**

should withdraw that rejection and permit the earlier-filed application to issue as a patent . . . (Emphasis added)

Inasmuch as this double patenting rejection is the only rejection remaining in the present application, Applicants submit that this rejection should be withdrawn, consistent with the clear language of the MPEP.

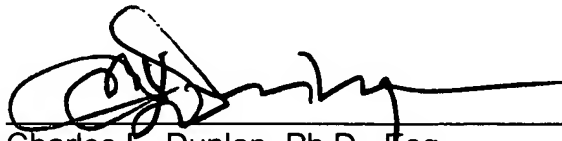
Request for reconsideration:

It is respectfully requested that the claims be reconsidered after consideration of the reasons for allowability that are discussed above and be found to be allowable. If one or more of the claims are found to not be allowable, a telephone call to the undersigned would be appreciated in order to resolve any remaining issues.

Respectfully submitted,

Nelson Mullins Riley & Scarborough LLP

Dated: February 2, 2007

A handwritten signature in black ink, appearing to read 'Charles E. Dunlap', is written over a horizontal line.

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